

# ABSTRACT OF THE DISCLOSURE

A manufacturing method for an electron-emitting source of triode structure, including forming a cathode layer on a substrate, forming a dielectric layer on the cathode layer, and positioning an opening in the dielectric layer to expose the cathode layer, wherein the opening has a surrounding region, forming a gate layer on the dielectric layer, except on the surrounding region, forming a hydrophilic layer in the opening, forming a hydrophobic layer on the gate layer and the surrounding region, wherein the hydrophobic layer contacts the ends of the hydrophilic layer, dispersing a carbon nanotube solution on the hydrophilic layer using ink jet printing, executing a thermal process step, and removing the hydrophobic layer. According to this method, carbon nanotubes are deposited over a large area in the gate hole.